



**DEPARTMENT OF THE AIR FORCE**  
**HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY**

MEMORANDUM FOR SEE DISTRIBUTION

MAR 24 2000

FROM: HQ AFCESA/CES  
139 Barnes Drive Suite I  
Tyndall AFB FL 32403-5319

SUBJECT: Establishment of Potable Water Use Baseline

1. The Department of Energy (DOE) has selected FY00 as the baseline year for determining DoD potable water usage, and it will be used to determine compliance with future water conservation goals. This will require bases and commands to report their potable water usage in FY00.
2. Background: Executive Order 13123, 3 Jun 99, encourages federal agencies to reduce costs and implement cost-effective water efficiency improvements at federal facilities. It requires the Secretary of Energy to provide guidance to assist each agency in determining a baseline of water consumption and establish water conservation goals for federal agencies by 3 Jun 00. To comply with this Executive Order, the Air Force will be required to establish baseline of potable water usage at all bases and facilities owned by the Air Force. The Secretary of Energy has defined this baseline year as FY00 (1 Oct 99 through 30 Sep 00). Bases should be collecting actual data where available, or make a best estimate where actual data is not available. (See Atch 2, DOE Guidance on Base Line Water Usage, 2 Dec 99, which contain water usage tables for nonmetered facilities. MIL-HDBK 1005/7A, Water Supply Systems, also contains some tables that may be helpful in determining unmetered water usage.)
3. One option for collecting the data necessary to compute the water usage baseline is to use the information in the Defense Utility Energy Reporting System (DUERS). Currently, more than 95 percent of bases report their monthly potable water usage as a component of DUERS. The major advantage using the information in DUERS is most bases are already providing the information. The major disadvantage is the system requires bases to enter monthly usage in millions of gallons. Bases must round up or down to the nearest million gallons, and no decimal point is allowed. This could skew the baseline for locations with low monthly water usage. In addition, there are gaps in the FY99 data that must be avoided in the FY00 data, if we are to use it to develop the baseline. Please note DUERS also has the ability to track recycled/reclaimed water usage in addition to potable water. However, few bases use this feature. To give you an idea of the potable water data available from DUERS, attachment three is the water consumption data reported in FY99 from DUERS. If your base or location is not listed, then the FY99 data was not available from DUERS. A decision on the final method for reporting the potable water usage for computing the FY00 baseline will be made at the upcoming Air Force MAJCOM Water/Wastewater conference. The conference will be held this summer. However, the exact date and location have not been determined.

4. In addition to reporting the quantity of water used, recommend bases also collect and record information on base population; quantities of housing, dormitory and transient living quarters (resident and nonresident population); irrigated acreage; annual rainfall; major mission or weapon system changes; water conservation projects; and nonpotable water usage (reclaimed water, untreated surface water, "gray water," nonpotable wells, etc.). This type of information will be helpful in explaining changes in base potable water usage in future years.

5. Conservation goals for future years have not yet been established. Air Force representatives, along with representatives from the other services, are working with the DOE to establish these goals by the 3 Jun 00 deadline. It is likely the conservation goals will be based on the implementation of best management practices instead of a percent reduction in usage. Information on these conservation goals will be released as soon as it becomes available. For information on water conservation planning and implementation, see MIL-HDBK-1165, Water Conservation.

6. As information becomes available, it will be posted on the HQ AFCESA Water Systems Program web page at <http://www.afcesa.af.mil/Directorate/CES/Civil/Water/Water.htm>. We anticipate publishing an A-Gram on this subject once the goals, policies, and procedures have been finalized. The point of contact for this issue is Mr. Michael X. Clawson, HQ AFCESA/CESC, DSN 523-6362.

*(SIGNED)*

MICHAEL J. COOK, Colonel, USAF  
Director of Technical Support

Attachments:

1. Distribution List
2. DOE Guidance on Base Line Water Usage, Dec 99
3. FY99 DUERS Water Consumption Data

## DISTRIBUTION LIST

HQ USAF/ILEV  
1260 AIR FORCE PENTAGON  
WASHINGTON DC 20330-1260

HQ AETC/CEO  
266 F STREET WEST (BLDG 901)  
RANDOLPH AFB TX 78150-4321

HQ AFRC/CEO  
155 2ND STREET  
ROBINS AFB GA 31098-1635

HQ AMC/CEV  
507 A STREET  
SCOTT AFB IL 62225-5022

HQ AFCEE/EQ  
3207 NORTH ROAD  
BROOKS AFB TX

HQ PACAF/CEC  
25 EAST STREET STE D-306  
HICKAM AFB HI 96853-5412

HQ AFSPC/CEO  
150 VANDENBERG STREET STE 1105  
PETERSON AFB CO 80914-4150

HQ AFMC/CEC  
4225 LOGISTICS AVE SUITE 1  
WRIGHT-PATTERSON AFB OH 45433-5739

HQ ACC/CEOI  
129 ANDREWS STREET STE 102  
LANGLEY AFB VA 23665-2769

HQ AETC/CEV  
266 F STREET WEST (BLDG 901)  
RANDOLPH AFB TX 78150-4321

HQ AFSOC/CEC  
100 BARTLEY STREET STE 218E  
HURLBURT FLD FL 32544-5273

HQ AMC/CEO  
507 A STREET  
SCOTT AFB IL 62225-5022

HQ ANG/CEC  
3500 FETCHET AVENUE  
ANDREWS AFB MD 20762-5157

HQ USAFA/CEO  
8120 EDGERTON DRIVE STE 40  
USAF ACADEMY CO 80840-2400

HQ USAFE/CEO  
UNIT 3050 BOX 10  
APO AE 09094-5010

HQ AFMC/CEV  
4225 LOGISTICS AVE SUITE 1  
WRIGHT-PATTERSON AFB OH 45433-5739

## **Guidance to Federal Agencies for Determining Baseline Water Usage**

### **2 Dec 99**

#### *Background*

Executive Order 13123 encourages federal agencies to reduce costs and implement cost-effective water efficiency improvements at federal facilities. The Secretary of Energy must provide guidance to assist each agency to determine a baseline of water consumption and will establish water conservation goals for federal agencies by 3 Jun 00.

Baseline water information will be used to describe total estimated federal water usage and monitor the impact of future water efficiency improvements. It is likely available data is incomplete, so an important component of this process will be to assess the existing data, improve the estimation process, and ultimately to collect more complete data on water use at federal facilities. Agencies are encouraged to focus baseline development efforts on the subset of buildings comprising the majority of water usage.

#### *Baseline Water Usage*

Agencies shall establish baseline potable water usage at facilities owned by the United States government. The baseline year is defined as FY00 (1 Oct 99 through 30 Sep 00). Data shall be reported in million gallons per year (MGY). Agencies should use actual data where available, or make a best estimate where actual data are not available.

#### *Facilities Where Actual Data Are Available*

Agencies should use data from one or more of the following sources: facility meter(s), the local water/wastewater supplier(s), and/or metered well(s) and spring(s). If multiple data sources are used, care should be taken to not "double count."

#### *Facilities Where Actual Data Are Not Available*

Agencies with facilities where no actual water usage information is available should estimate water usage. If a facility has had a recent water use survey, agencies can use those results to estimate water use. Otherwise, to achieve a reasonable estimate, agencies should, at a minimum:

1. Identify the significant factors which determine water usage, such as number of beds in a hospital, number of prisoners, number of employees and visitors, production units, and /or irrigated acreage;
2. Determine the numeric value for those factors;
3. Then, multiply the numeric value by water use indices to be provided by the Federal Energy Management Program (FEMP). FEMP will provide water use indices for hospital beds, prisoners, employees, dwelling units, and schools. Agencies with other significant or unusual water usage should contact FEMP for assistance.

#### *Schedule/Reporting*

Agencies shall report FY00 water usage to the DOE in their FY00 annual energy reports. DOE shall provide a reporting format to federal agencies by Jun 00. Federal water usage will

thereafter be reported every two years beginning in 2002. Agencies will also report water conservation measures implemented and water saved on an annual basis. It is anticipated the total estimated federal water usage would decrease over time, due to future implementation of water efficiency measures. DOE recognizes some agencies may have future increases in water usage for legitimate reasons, such as changes in numbers of visitors, employees, and production. In the FY00 report, agencies should describe those factors that would explain any future increases in water usage. These factors may be similar to those identified in the baseline estimation methodology described above.

## Federal Water Use Indices

		Gallons/unit/per day		
Category	User	Unit	Range	Typical
Commercial				
	Airport	Passenger	4-5	3
	Apartment house	Person	100-200	100
	Boarding house	Person	25-50	40
	Hotel	Guest	40-60	50
		Employee	8-13	10
	Lodging house and tourist home	Guest	30-50	40
	Motel	Guest	25-40	35
	Motel with kitchen	Guest	25-60	40
	Laundry (self-service)	Machine	400-650	550
	Office	Employee	8-20	15
	Public Lavatory	User	3-6	5
	Restaurant (including toilet)			
	Conventional	Customer	8-10	9
	Short-order	Customer	3-8	8
	Shopping center	Parking Space	1-3	2
		Employee	8-13	10
	Open Space			
	Non-turf	Acre		785
	Turf	Acre		1571
Recreational				
	Apartment, resort	Person	50-70	60
	Bowling alley	Alley	150-250	200
	Camp			
	Pioneer type	Person	15-30	25
	with toilet and bath	Person	35-50	45
	Day, with meals	Person	10-20	15
	Day, without meals	Person	8-18	13
	Trailer	Trailer	75-150	125
	Campground	Person	20-40	30
	Country club			
		Members	80-125	100
		Employee	10-15	50
	Dormitory (bunk house)	Person	20-45	35
	Fairground	Visitor	1-2	3
	Picnic park with flush toilets	Visitor	5-10	6
	Swimming pool and beach	Customer	5-15	10
		Employee	8-15	10
	Visitor center	Visitor	4-8	5
Institutional				
	Assembly hall	Seat	2-4	3
	Hospital medical	Bed	130-250	150
		Employee	5-15	10
	Hospital mental	Bed	80-150	120
		Employee	5-15	10

	Prison	Inmate	80-150	120
		Employee	5-15	90
	Rest home	Resident	5-120	90
		Employee	5-15	10
	School day			
	with cafeteria, gym and showers	Student	15-30	25
	with cafeteria only	Student	10-20	15
	without café & gym	Student	5-15	10
	School, boarding	Student	50-100	75

## Water Conversion Chart

### Volume conversion

1 gallon (gal)	=	8.34 pounds
1 cubic foot (ft <sup>3</sup> )	=	7.48 gallons
1 unit (Ccf)	=	748 gallons
1 acre-foot (AF)	=	325,851 gallons
1 acre-foot (AF)	=	43,560 cubic feet
1 million gallons/day (MGD)	=	1121 acre feet/year

### Metric conversions

1 acre	=	.4 hectares
1 gallon	=	3.8 liters
1 cubic foot	=	0.03 cubic meters

**FY99 Potable Water Usage in Mil Gal From DUERS**

? Indicates no data available for that month

Base	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99	FY Total
ALTUS AFB	32	20	16	12	15	16	22	22	26	49	59	39	328
ANDERSEN AFB	63	58	60	60	47	55	74	77	79	77	74	71	795
ARNOLD AFB	17	19	18	18	17	19	18	16	18	22	19	21	222
ARWS (Alaska)	5	4	4	4	4	4	4	3	3	3	3	3	44
AVIANO AB	11	11	12	12	12	14	14	25	19	19	16	16	181
BARKSDALE AFB	24	23	13	13	18	15	13	12	33	30	38	29	261
BEALE AFB	47	28	29	33	29	32	44	101	112	129	116	102	802
BOLLING AFB	14	14	14	14	8	7	8	12	16	20	18	10	155
BROOKS AFB	13	10	9	10	10	10	10	10	11	15	23	21	152
CANNON AFB	32	21	22	23	22	26	33	40	40	46	40	37	382
CAPE CANAVERAL	24	22	21	21	20	18	23	16	22	23	18	16	244
CHARLESTON AFB	16	20	19	21	16	17	21	19	25	16	22	22	234
CHEYENNE MTN AFB	2	1	1	1	1	1	?	?	?	?	?	?	7
COLUMBUS AFB	13	14	10	13	11	11	11	13	16	14	24	16	166
DAVIS MONTHAN AFB	50	40	32	33	33	31	47	69	79	46	58	35	553
DOBBINS ARB	2	6	2	2	2	4	2	2	2	12	12	3	51
DOVER AFB	26	25	24	26	23	26	27	38	45	36	36	27	359
DYESS AFB	46	26	25	32	21	20	31	29	43	36	60	37	406
EDWARDS AFB	98	94	61	72	59	104	125	133	93	191	238	204	1472
EGLIN AFB	112	88	80	79	81	90	133	131	129	120	134	117	1294
EIELSON AFB	52	47	49	43	55	40	29	36	40	40	31	23	485
ELLSWORTH AFB	28	25	26	28	28	24	27	26	34	37	45	40	368
ELMENDORF AFB	107	103	103	92	100	67	89	94	115	89	88	100	1147
F E WARREN AFB	12	14	13	12	19	23	17	24	24	?	?	?	158
FAIRCHILD AFB	135	70	51	51	50	50	43	46	48	50	65	52	711
FALCON AFB	12	5	5	6	4	6	8	7	9	16	13	15	106
GEN MITCHELL FLD		?	1	?	?	1	?	?	2	1	?	1	6
GOODFELLOW AFB	31	18	13	14	13	16	21	20	21	28	30	28	253
GRAND FORKS AFB	34	33	32	34	43	35	23	23	60	23	35	40	415
GRISSOM AFB	12	12	12	12	12	12	12	12	12	12	12	12	144
GUNTER AFB	13	9	10	9	10	9	9	14	13	12	16	10	134
HICKAM AFB	285	163	136	169	128	154	193	170	188	264	224	276	2350
HILL AFB	52	46	48	44	35	42	49	59	115	160	139	112	901



Base	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99	FY Total
HOLLOMAN AFB	55	40	46	54	44	64	73	85	95	85	77	65	783
HOMESTEAD AFB	3	3	3	3	3	3	3	3	3	3	3	3	36
HOWARD AFB	27	52	35	31	36	44	43	31	33	36	27	29	424
HURLBURT FLD	20	19	18	17	14	16	22	24	26	23	15	15	229
INCIRLIK AB	80	59	59	57	51	57	?	?	?	74	93	84	614
IZMIR AS	4	3	2	3	2	2	3	3	2	4	4	3	35
KADENA AB	180	177	166	196	176	198	153	163	160	150	163	164	2046
KEESLER AFB	77	65	63	86	82	93	101	122	105	95	100	84	1073
KELLY AFB	62	56	58	54	52	57	59	65	67	69	71	66	736
KIRTLAND AFB	62	37	29	28	25	43	57	69	103	170	133	104	860
KUNSAN AB	27	29	27	27	27	24	28	28	29	28	28	29	331
L G HANSCOM AFB	11	10	10	9	8	10	14	11	10	16	17	12	138
LACKLAND AFB	68	47	45	49	53	61	59	64	71	82	101	94	794
LAJES FIELD	15	15	15	15	15	15	15	15	15	15	15	15	180
LANGLEY AFB	40	30	28	25	23	27	49	31	14	37	34		338
LAUGHLIN AFB	23	15	15	17	20	30	29	30	29	30	49	38	325
LITTLE ROCK AFB	23	20	20	21	18	20	21	22	31	31	42	30	299
LOS ANGELES AFS	11	7	6	6	5	5	9	12	12	13	13	13	112
LUKE AFB	37	23	19	18	20	22	28	46	66	24	67	58	428
MACDILL AFB	46	38	46	?	?	?	51	56	47	31	26	37	378
MALMSTROM AFB	21	17	16	19	17	19	19	22	28	37	51	?	266
MARCH AFB	27	16	9	13	14	14	22	58	30	29	41	30	303
MAXWELL AFB	43	38	34	30	34	35	31	41	39	37	52	42	456
MCCHORD AFB	26	29	29	29	26	30	31	35	47	47	57	65	451
MCCLELLAN AFB	52	35	31	21	15	14	32	24	25	68	77	77	471
MCCONNELL AFB	12	11	11	3	6	6	6	15	11	27	16	26	150
MCGUIRE AFB	40	31	34	34	34	40	35	42	53	54	54	52	503
MINOT AFB	38	33	28	31	29	26	28	32	31	36	40	35	387
MISAWA AB	55	61	60	63	64	59	61	57	57	51	61	58	707
MOODY AFB	12	14	14	12	12	13	16	17	15	15	16	15	171
MORON AB	9	10	10	9	11	14	16	15	16	16	15	14	155
MPLS-ST PAUL IAP	1	1	1	1	1	1	1	1	1	1	2	2	14
MT HOME AFB	34	18	19	19	17	20	38	72	90	134	120	90	671
NELLIS AFB	101	60	61	45	46	87	89	122	151	147	167	172	1248
NIAGARA FALLS ARS	?	?	5	?	?	5	?	?	5	?	?	9	24
OFFUTT AFB	38	38	33	35	36	31	38	36	45	47	53	47	477

Base	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99	FY Total
OSAN AB	65	56	53	56	52	55	54	55	65	67	57	227	862
PATRICK AFB	46	49	39	34	38	55	86	236	52	60	57	34	786
PETERSON AFB	37	11	11	11	12	22	19	34	47	66	46	?	316
PITTSBURGH IAP	1	1	1	1	1	1	1	1	1	1	1	1	12
POPE AFB	27	26	21	19	19	17	19	18	29	29	31	32	287
RAF ALCONBURY	8	9	8	13	10	11	6	4	4	13	5	5	96
RAF CROUGHTON	2	2	2	2	2	2	2	4	4	2	2	2	28
RAF FAIRFORD	8	8	8	8	8	8	8	8	8	8	9	8	97
RAF LAKENHEATH	15	14	15	14	14	15	14	16	15	16	17	14	179
RAMSTEIN AFB	40	39	40	42	36	41	40	44	46	48	50	50	516
RANDOLPH AFB	23	25	26	25	35	32	33	35	33	52	52	40	411
RHEIN MAIN AB	5	5	6	13	12	15	13	13	14	19	18	21	154
ROBINS AFB	106	91	80	77	58	74	76	92	111	115	66	68	1014
SCOTT AFB	43	40	37	40	34	32	37	33	44	49	54	63	506
SEYMOUR JOHNSON AFB	27	25	22	23	29	29	27	30	33	23	28	22	318
SHAW AFB	32	23	23	24	25	22	29	33	43	34	45	41	374
SHEPPARD AFB	71	36	28	33	29	33	38	83	40	76	94	43	604
SPANGDAHLEM AB	12	12	13	25	23	17	13	12	4	12	11	11	165
TINKER AFB	73	65	67	99	99	100	120	71	98	72	139	101	1104
TRAVIS AFB	98	58	51	46	30	18	25	55	160	144	162	133	980
TYNDALL AFB	45	37	35	30	25	33	48	64	44	?	?	46	407
USAF ACADEMY	46	45	34	29	25	38	35	60	71	96	67	65	611
VANCE AFB	5	4	5	5	5	5	5	5	7	8	8	8	70
VANDENBERG AFB	108	70	66	72	49	73	73	127	146	160	171	110	1225
WESTOVER ARB	1	1	1	5	5	4	3	4	8	?	8	9	49
WHITEMAN AFB	20	18	17	18	16	19	20	21	23	31	31	24	258
WILFORD HALL	14	14	14	14	14	14	14	14	14	14	14	14	168
WILLOW GROVE ARS	1	1	1	2	2	2	1	1	1	1	1	2	16
WRIGHT PATTERSON AFB	90	88	106	85	65	110	71	80	127	101	102	114	1139
YOKOTA AB	78	99	78	83	80	73	80	78	84	86	89	?	908
YOUNGSTOWN MAP	1	1	1	1	1	1	1	1	1	1	1	1	12

Air Force Total (Million Gallons)

45571

**Reclaimed/Recycled Usage**

Base	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99	FY Total
ARNOLD AFB	1	2	2	2	2	2	2	1	1	1	1	1	18
BEALE AFB	17	1	1	1	1	3	13	23	25	25	24	22	156
SEYMOUR JOHNSON AFB	16	?	?	?	?	?	?	?	?	?	?	?	16
WHITEMAN AFB	1	1	1	1	1	1	1	1	1	1	1	1	12